

Beginning at the western end of the belt of country examined, the first rocks met with, forming the lower slopes of the Karangahake Range and the isolated range west of the coach-road from Paeroa to Karangahake, are dark augite andesites belonging to the Beeson's Island group: rocks that by most geologists who have studied the volcanic series of Cape Colville Peninsula are considered as belonging to the latter part of the Miocene Period. With these are often associated coarse angular agglomerate, almost without a finer ash-matrix, and breccias varying from medium to very coarse with ash-matrix. These rocks rise not more than 200 ft. on to the western slope of Karangahake Mountain and the spur therefrom that runs to the northward between the Ohinemuri valley and the western plain.

From beneath the Miocene rocks appear grey trachytic rocks that along the northern part of the belt reach to the crest of the ridge overlooking the Ohinemuri at Karangahake Township, and more to the south rise into and form the western higher spurs of Karangahake Mountain. On the western slope of the spur range and the mountain itself these rocks contain small reefs and leaders of quartz that since the first opening of the Ohinemuri Goldfields have been known to be auriferous, but as yet no successful workings in connection with them have been carried on. Eastward of these, and forming the high spur immediately north-west of the peak of Karangahake, acidic rocks as spherulitic rhyolite are developed, and in these, within the Talisman Extended Claim, are numerous small reefs and leaders of quartz that appear to be the southern extension of the Woodstock lode in the Woodstock United Claim.

This spherulitic rock continues to the north till, in the line of the Ohinemuri Gorge, it is met and overlain by dark augite andesites, the south prolongation of a development of such rocks to the north, or farther down the Ohinemuri Valley. Grey andesites underlie the Acidic rocks and near the surface have for the most part been by solution and leaching deprived of their hornblende minerals. And with these are associated beds of greenish breccia of medium coarseness and ashbeds, and these again are underlain by a great thickness of more or less altered andesite that contains the various reefs within the Woodstock United, Talisman, and Crown Mines. All these rocks appear on the east side of and form the mass of Karangahake Mountain. They belong to the eldest group of volcanic rocks—the Thames-Tokatea group—and east of the Ohinemuri and Waitewheta are arranged so as to dip at high angles to the westward. They are of interest and importance as containing the most valuable group of mines in the Middle and Lower Ohinemuri Valley.

From near the junction of the Waitewheta with the Ohinemuri, and on the west side of the valley, a columnar dyke of dark andesite strikes north along that side of the valley, and as far as the Crown Battery appears along two lines with a rib of greenish breccia rock between, belonging to the Thames-Tokatea group. This dyke, the only one in the Karangahake district, continues along the valley and channel of the river to Docherty's Creek, beyond which it passes through the ridge between the river and Mackaytown, and is not to be distinguished farther to the north.

In the south its columnar structure is very marked, but this beyond the Crown Battery becomes gradually less and less distinct till, where last seen above the ford of the Ohinemuri, this structure has totally disappeared.

Opposite the Crown Battery, on the right bank of the river, the rocks are greenish breccias, such as lie between the two branches of the columnar dyke of dark andesite, and these, though somewhat obscurely, can be traced west to the mouth of the Ohinemuri Gorge at Karangahake. Here a fault of considerable magnitude is present, which, striking south-east, has apparently displaced the country west of it to the south-east.

This fault is not identical with any of those found in the workings of the Woodstock Mine, or in the Crown Mine south of the Waitewheta, but lying to the east of these crosses the higher part of Tukane Hill within the north-eastern parts of those claims.

The Ohinemuri Gorge displays vertical cliffs of brownish decomposed andesite rising 300 ft. to 400 ft. in height on both sides of the gorge. On the north side Butler's Track is cut round the higher part of the cliff on that side, and the various exposures of rock made by road-cutting, both at the high and lower level of the present coach-road through the gorge, gives opportunity for examination of the rocks at various levels and horizons.

The rocks of this part are mainly altered andesites in which decomposition at and near the surface has altered most of the constituent minerals and given to the rocks a grey or rusty-brown colour.

A series of north and south joints traverse the rocks on both sides of the gorge, and at first sight give the impression that they have been tilted to a very high angle, and strike in the direction of the eastern slope of Karangahake Mountains. On Butler's Track it can be seen that the rocks dip to the south-east in the western part of the gorge and to the north-east in the middle higher part and western end of the gorge.

The various workings in the Woodstock Main Lode, or Ravenswood Claim, show the presence of considerable bodies of breccia and coarse ash-rock, and on Butler's Track there is a considerable thickness of crushed andesite again cemented to a solid rock that in cases might be mistaken for a true agglomerate. In the various mine-workings these rocks become greenish-grey in colour, but almost everywhere give evidence of alteration, more especially those parts that are solid lava flows.

These rocks terminate at the eastern end of the deeper part of the Ohinemuri Gorge: on the north side within the Shotover Claim and on the south side of the gorge east of the Ivanhoe Claim.

On account of their great interest as the oldest rocks of the southern goldfields of the peninsula, and their importance as gold-producing rocks, they were followed to the north along the range to the Rahu Saddle, where to the north-west and north-east they are overlain by the younger rocks of the Beeson's Island group.